

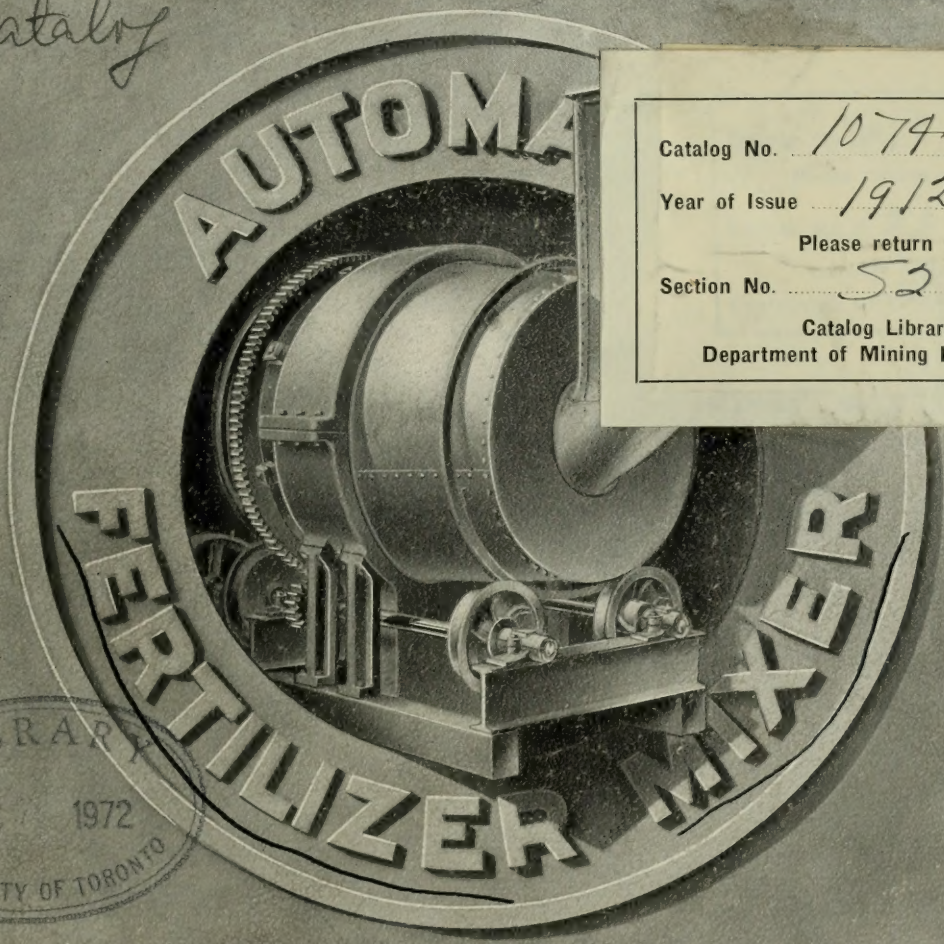
225
28
no. 80A
Engineering

ENGINE STORAGE

STURTEVANT

Mill Company, Boston

Catalog

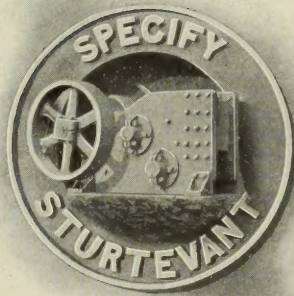


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HUNSO MIXER

CATALOG
No. 80A

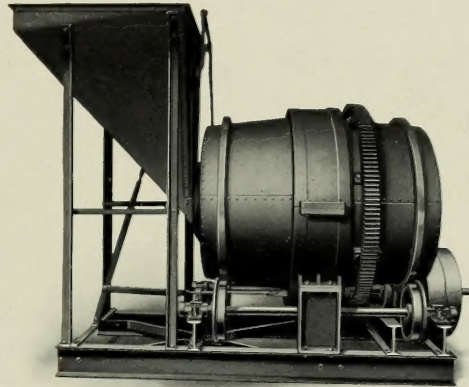


ESTABLISHED 1883

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STURTEVANT MILL CO.



STURTEVANT MILL CO.



MANUFACTURERS AND EXCLUSIVE
SALES REPRESENTATIVES OF PATENTED

CRUSHING, GRINDING, SCREENING, MIXING,
SACKING AND WEIGHING MACHINERY

MAIN OFFICES AND WORKS HARRISON SQUARE BOSTON, MASS., U. S. A.

AUXILIARY WORKS

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FOREIGN

STURTEVANT ENGINEERING CO., Ltd., LONDON

Paris

Brussels

Berlin

Vienna

Turin



HUNSO
AUTOMATIC
MIXER



STURTEVANT-HUNSO

Automatic or Batch Mixer for Mixing Fertilizer

TYPE. Automatic or Batch Mixer.

CAPACITY. One hundred to four hundred tons per day.
Batch every one to three minutes.

SIZES. One-fourth, one-half and one ton.

POWER. Two to six H. P.

UPKEEP. Practically nothing.

ACCURACY. Within one-tenth to one one-hundredth of one
per cent of theoretically correct analysis without adding
excess values.

LABOR SAVING. Three to six men on each bagging outfit
for each Mixer.

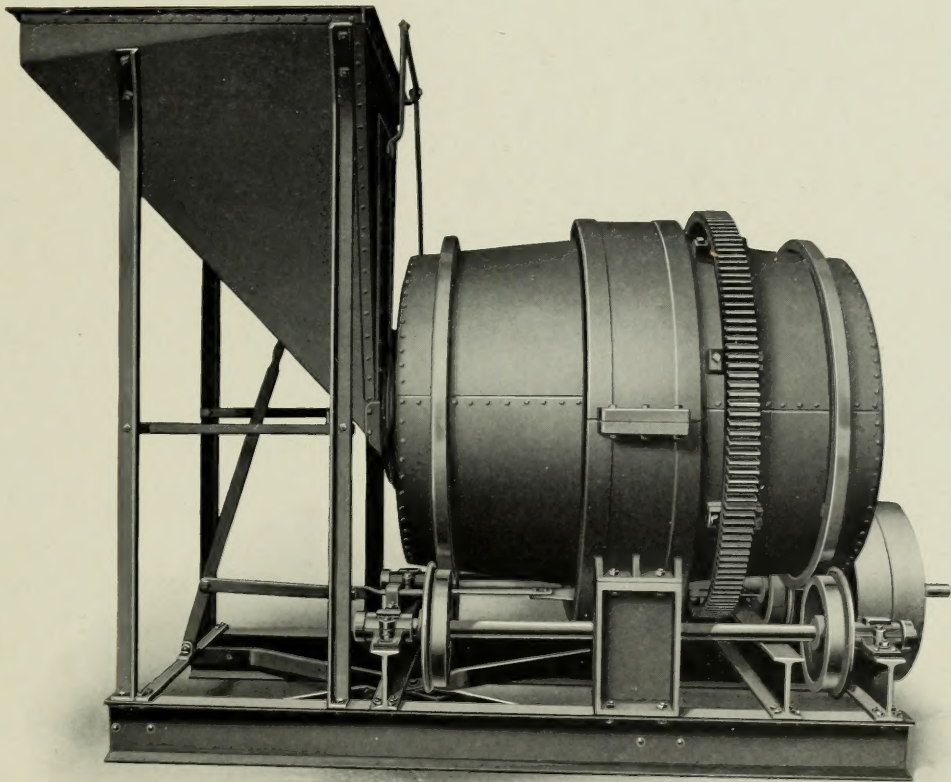
ACCESSIBILITY. Easy and quick access through door at back.

DUST-PROOF INTAKE AND DISCHARGE.

Sturtevant Mill Company
Harrison Square, Boston, Mass.



STURTEVANT
MILL
COMPANY



Hunso Automatic Mixer. Complete ready to run
The Only Automatic Fertilizer Mixer.
Continuous bottom discharge



HUNSO AUTOMATIC MIXER



REASONS FOR ITS ADOPTION

It saves every day at least eight dollars for labor alone, in large plants.

It mixes each hour twice as much as can be accomplished by the usual methods.

It is self-evident that if a ton of material is perfectly mixed, every sample taken from it will be exactly like every other sample.

Hunso mixing will be shown to be perfect mixing, and the actual benefits will appear in surprising savings.

The Hunso Automatic Mixer was called to our attention by Mr. W. D. Huntington, a member of the Executive Committee of the National Fertilizer Association whose good opinion of it had great weight with us, and has much facilitated its introduction to many important interests where it has received unqualified approval.

USES

The Hunso Automatic Mixer is used for mixing on a large or small scale, the materials used in fertilizers. Hot charges may even be taken from the dens, such as could not otherwise be used immediately, and then perfectly mixed without difficulty. This mixer cannot, however, produce with Sulphuric Acid, plain Acid Phosphate.

A SAMPLE OF WORK:

In a recent trial, a heap of complete goods weighing 2700 tons was automatically mixed by the Hunso. The ingredients of each charge of 1000 lbs. were as follows:

500 lbs. Hot Acid Phosphate
100 " Acid Fish Scrap with 50% moisture
100 " Garbage Tankage
300 " Hard Salts

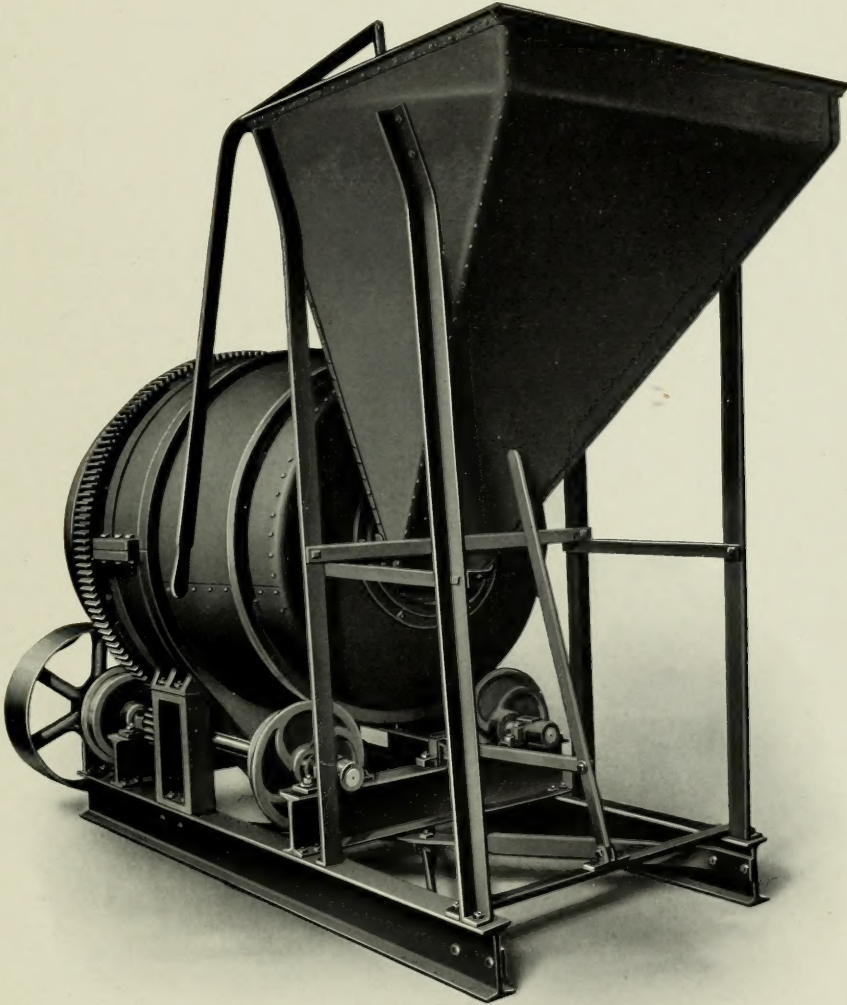
ANALYSIS

Ammonia.....1.09
Available Phosphate Acid.....8.07
Potash K-2-05.05

This proved to be as even a mixture as is probably possible to obtain; every sample was thoroughly dependable, and sustained the guarantee. The above mixture was made in very hot weather with great relief to the laborers employed. It has been found convenient to mix in 500, 1000 and 2000-lb. batches according to the size of the plant, and very little odor escapes therefrom in this process of mixing and disintegrating.



STURTEVANT
MILL
COMPANY



Hunso Automatic Mixer
Mixes Fertilizer ingredients at the rate of
100 to 400 tons per day.
Built in $\frac{1}{4}$, $\frac{1}{2}$, and 1 ton sizes.



HUNSO AUTOMATIC MIXER



AUTOMATONS

If a machine is absolutely automatic, it is an automaton and there can be no variation in its work. The Hunso Mixer is absolutely automatic (or can be used as a batch mixer if desired). The instant a charge is put into it, mixing begins, and thereafter cannot be varied; and after a definite number of revolutions it discharges itself. Every mixing member has done exactly its designed and perfect work, and in unavoidable succession. The next charge follows precisely the same routine, and is finished in the same time. The process of mixing is uncontrollable. The attendant takes no part in it. Why should not every batch of the same weighing be mixed exactly like every other? It is!

PERFECT MIXING AS A FACT

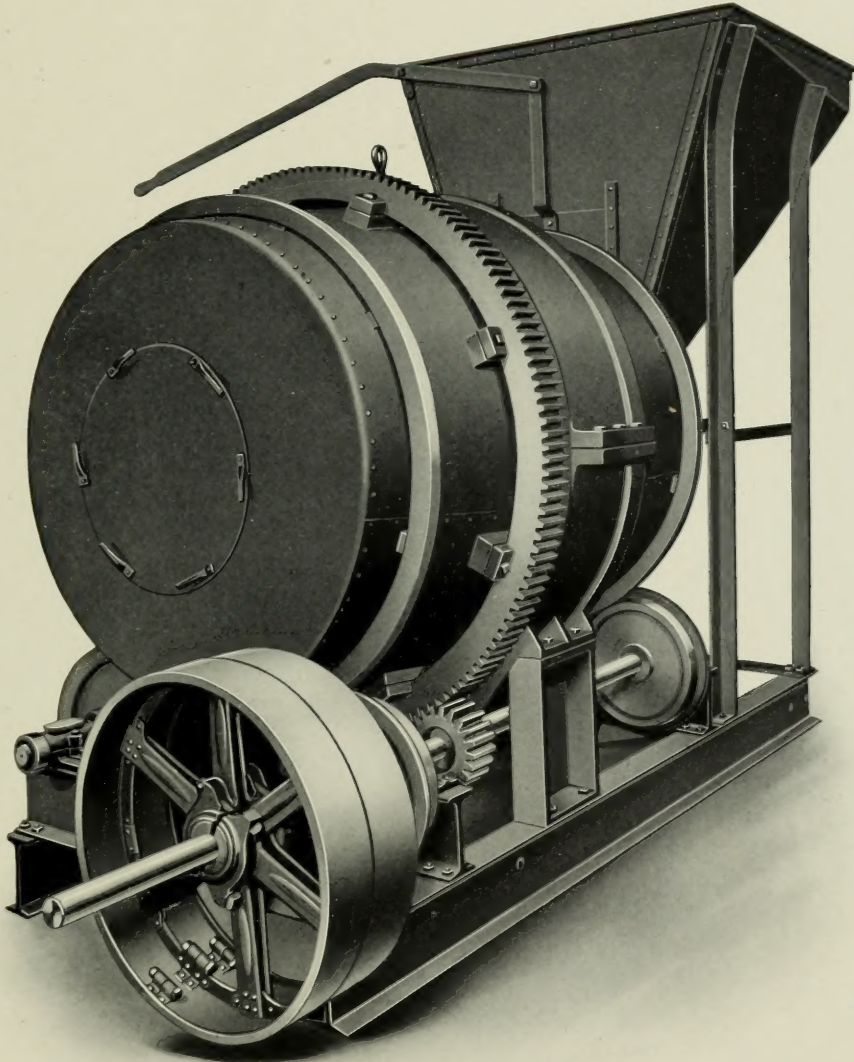
Experience has taught that the Hunso Automatic Mixer, revolving 22 times a minute, will perfectly mix 500, 1000 or 2000 lbs. of fertilizer ingredients in from nine to eighteen seconds. Whatever output the machine gives, it may be depended on to produce goods that are alike and that will analyze to within one-tenth to one-hundredth of one per cent of the theoretically proper analysis. Any slight difference from perfection is always the result of imperfect weighing of materials, or careless analysis—never of imperfect mixing. Weighing is manual—the analysis also depends upon the care of the chemist—but Hunso mixing is perfectly automatic and dependable.

PROTECTION TO THE MANUFACTURER

It is obvious that if samples are drawn from different bags of a guaranteed fertilizer that these samples will differ unless the ingredients have been perfectly mixed. The savings therefore, effected by perfect mixing, to manufacturers who guarantee their goods, are also self-evident. But many reliable houses, mixing fertilizers, in the usual manner, have found it expedient to put into every lot mixed an excess of important ingredients—this is done under the mistaken idea that they make sure that the guaranteed analysis will be thus attained, but such is not always the case. It is not by generosity—which is not appreciated, because not known, and has cost on the average from 75c. to \$1.00 per ton—that the manufacturer is made really safe. It is only by automatic, unvarying and perfect mixing that every sample can be depended on to be like every other sample and this extra outlay per ton be safely saved.



STURTEVANT
MILL
COMPANY



Hunso Automatic or Batch Mixer
Note its simple and massive construction.
Its accessibility through the door at the back of machine.



HUNSO AUTOMATIC MIXER



The plant food given away last year, in the two States of which statistics are given, cost the manufacturers \$308,500.00. Some of this money was wasted, notwithstanding the liberality of the manufacturers, because samples drawn from even honest fertilizers that are imperfectly mixed will vary, and station chemists reported many such goods as below the guarantee. Hunso mixing would have saved enough money to pay for many mixers, and saved some smirching of reputations. It is plain that every manufacturer should seek safety by perfect mixing. Better not "give up"—but automatically mix up. Giving consumers more value than they pay for, or know of, is not good business. Does it not seem to you that automatic mixing is important?

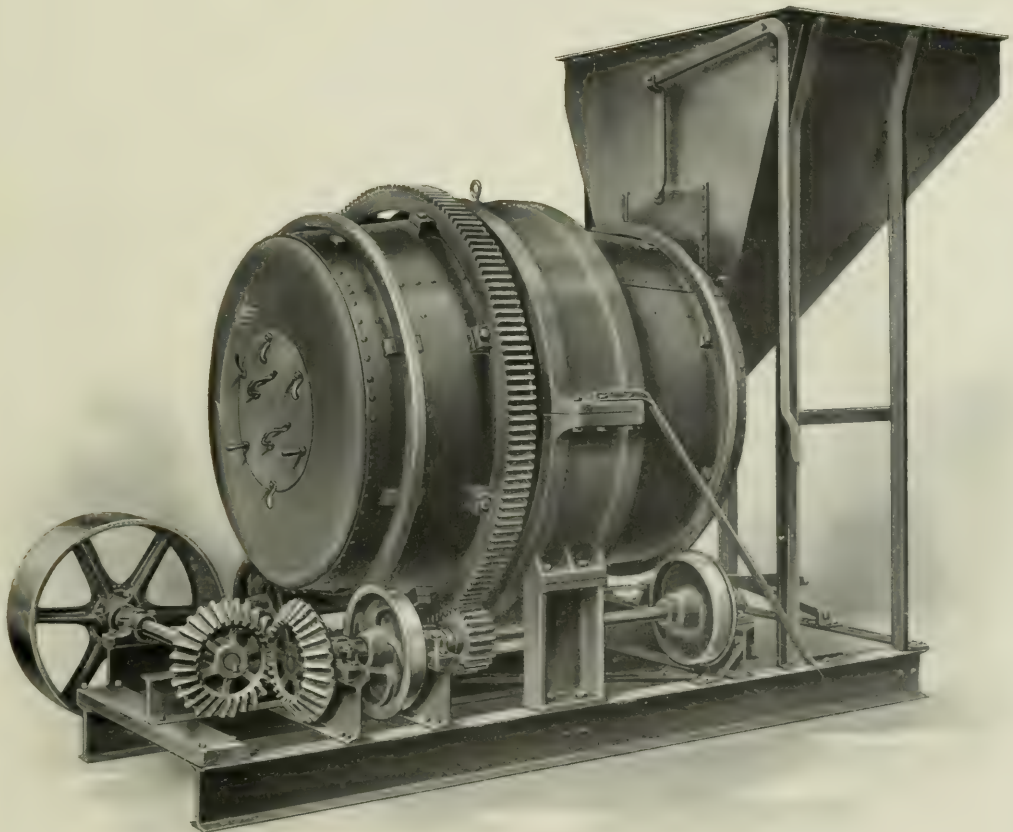
WHY IMPORTANT

Because it is not possible for materials introduced into the Hunso Automatic Mixer to escape before being thoroughly mixed. This is only because its work is automatic. No human agency whether reliable or unreliable can prevent each charge taken from the hopper from being mixed exactly like every other charge. Discharge from the drum is through the series of openings leading from the drum to the stationary outside housing, and the opening and closing of the outlets from drum to housing occur every 3-25ths of a second; obviously, nothing can escape from the drum irregularly. All materials in the drum are treated exactly alike; all receive the same hustling, tumbling, oppositely throwing and disintegrating treatment. The mixture is discharged continuously, and in passing through the outside housing is scraped and hoed, and further mixed and disintegrated with a thoroughness that leaves nothing to be desired. The tumble mixing is completed by the drum's interior flights (that throw oppositely), long before the materials can get to the middle of the drum ready to escape to the housing. In the latter they get among its scrapers that plow and further mix and disintegrate and finally throw out of the housing.

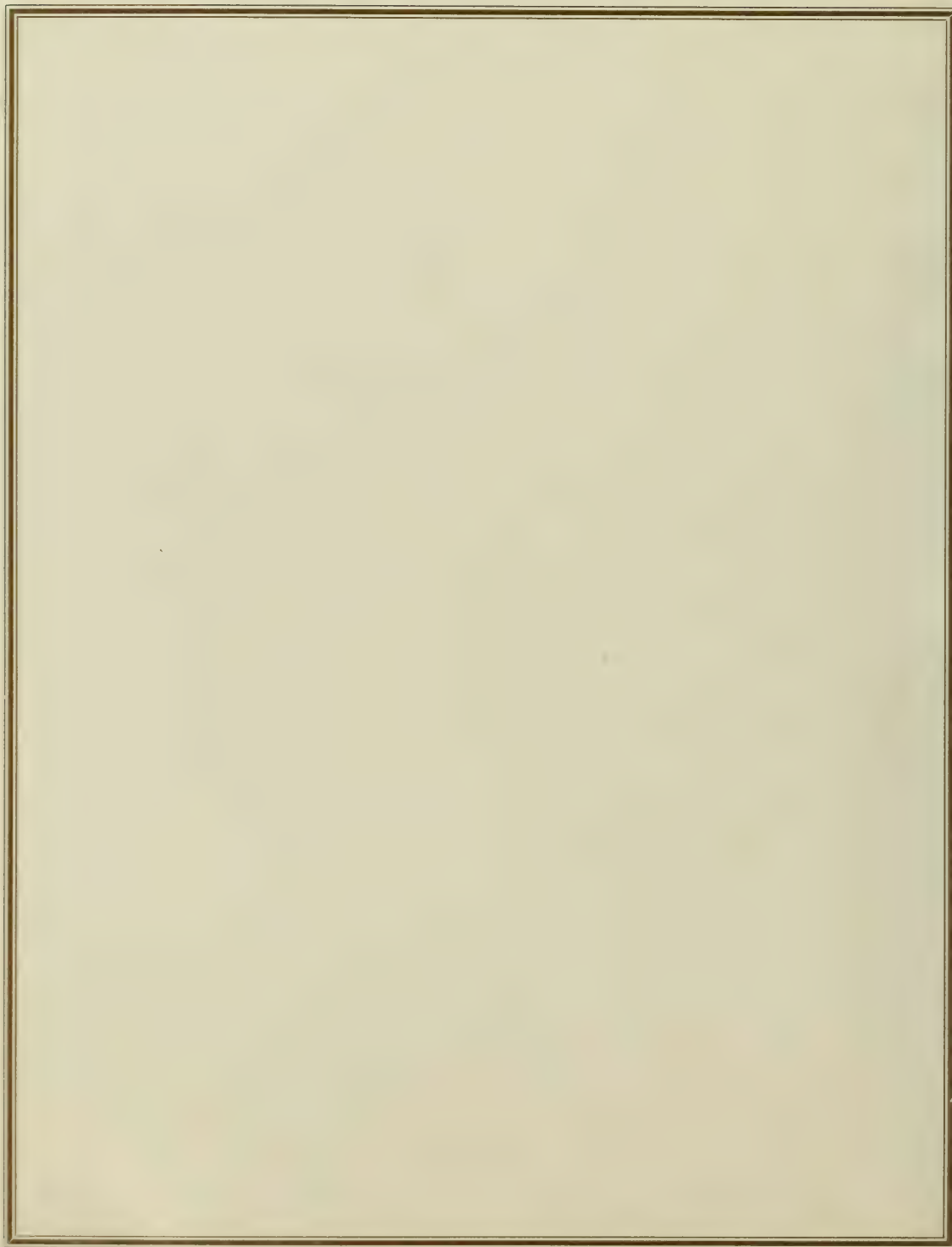
Discharge from the housing is at its lowest point and continuous. No stop is made to receive a charge. The drum runs continuously. When one charge has made exit, another is going into the supply hopper from the elevator to be let into the mixer as soon as it all arrives. The whole operation is accomplished just as fast as the material from the mixer can be bagged, and much faster than this when it is let out of the mixer without bagging.



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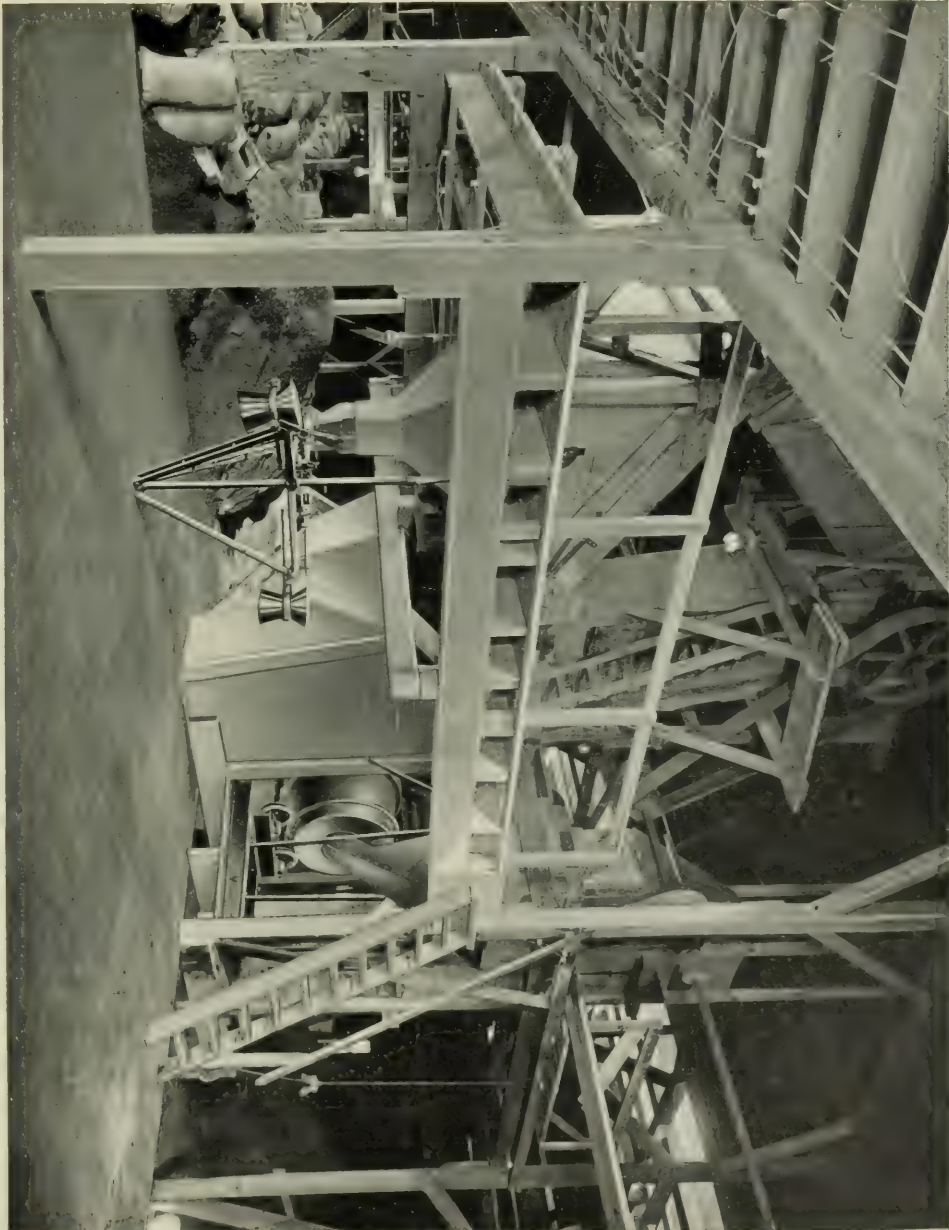


Hunso Automatic Mixer. Complete ready to run
Showing Special right angle drive





STURTEVANT
MILL
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A Hunso Fertilizer Mixing Plant



HUNSO AUTOMATIC MIXER



HOW THE RAW MATERIALS ARE DELIVERED TO THE MIXER

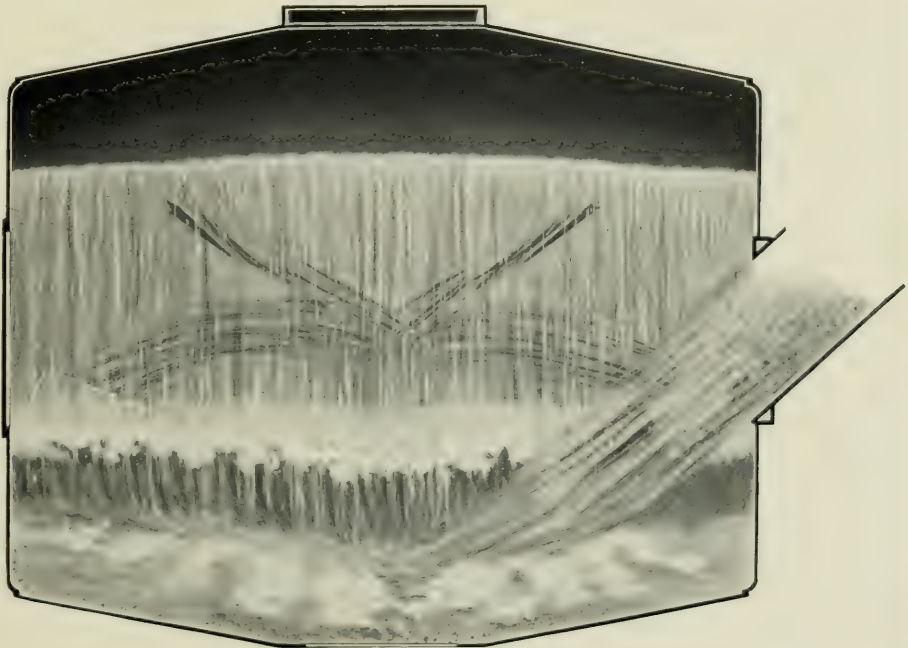
The several ingredients are weighed and assembled at the boot of an ordinary elevator in wheelbarrows, and then dumped into the elevator which carries up and discharges into the hopper at one end of the mixer. The hopper is arranged to receive 500, 1000 or 2000 lbs. as desired. When the door from the hopper is opened by means of a lever the charge is emptied immediately into the empty mixer drum; and from this moment it is beyond control, and is mixed and mixed and disintegrated, and finally discharged, in from 9 to 18 seconds according to the ingredients. Quick work this, and thorough!

It is plain that no time is lost, and if the wheelbarrow supply gang is properly organized, batches are going into the foot of the elevator at a great rate; but these operations are less rapid than those following. Mixing is at all times quicker than preparing and supplying the ingredients to the elevator. About 160 tons is in some plants mixed in five hours.

That the Hunso Mixer will mix difficult materials without clogging, is shown by the following statement of work at the plant of the Buffalo Fertilizer Company. In this instance Hot Acid Phosphate ten hours old was taken from the hot dens, and mixed continuously in 1000 lb. charges for ten hours, 120 lbs. of Carbonate of Lime was used as a dryer in each 1000 lb. charge; there was no clogging, and an examination at the close of the day showed very little material adhering to any part of the drum. Manufacturers will admit that the machine could not easily in practical work have been put to a more severe test.

ACCESSIBILITY—SIMPLICITY

The door of the Mixer is shown secured by bolts, (see page 7) giving easy access to the interior. In simplicity the Hunso is a wonder. No other Mixer can compete with it in thoroughness, or rapidity of action; no other is automatic, or has so few parts, and these so durable, and so cheaply replaced. They need not be described; the cuts exhibit clearly every one. The interior arrangement of the Hunso Automatic Mixer has puzzled many mechanics who have not seen the inside, nor the cuts that show the same, but have only witnessed from the outside the remarkably effective operation of this machine: but the mystery has only been because of its unexpected simplicity. Simplicity is always the unexpected; and the last word in development.



FIVE SEPARATE MIXING ACTIONS

The charge is assembled in the hopper – the gate opened—and the material passes through the dust-tight intake into the mixing chamber.

1st Action: Material thrown by the deflectors in a corkscrew motion toward the back of drum.

2nd Action: The second set of six deflectors throws the material back upon itself to the front or starting point.

3rd Action: All material falling on side of drum is carried up and over by the longitudinal channels, and is cascaded toward the centre, where it meets the material in violent motion from actions one and two.

4th Action: The deflectors quartering or dividing the material that falls on them.

5th Action: The material turning over and over on itself passing down the revolving incline towards the centre, in its efforts to get to the point of discharge.



HUNSO AUTOMATIC MIXER



COMPLETE MIXING ASSURED

How is it possible for material to escape unmixed after passing through these violent and opposing actions, where every particle is mingled and intermingled with its neighbors, in such a complete and forceful manner?

It is not surprising that Hunso mixtures give a nearly perfect analysis and that users save the excess ingredients usually given away to make sure of the analysis.

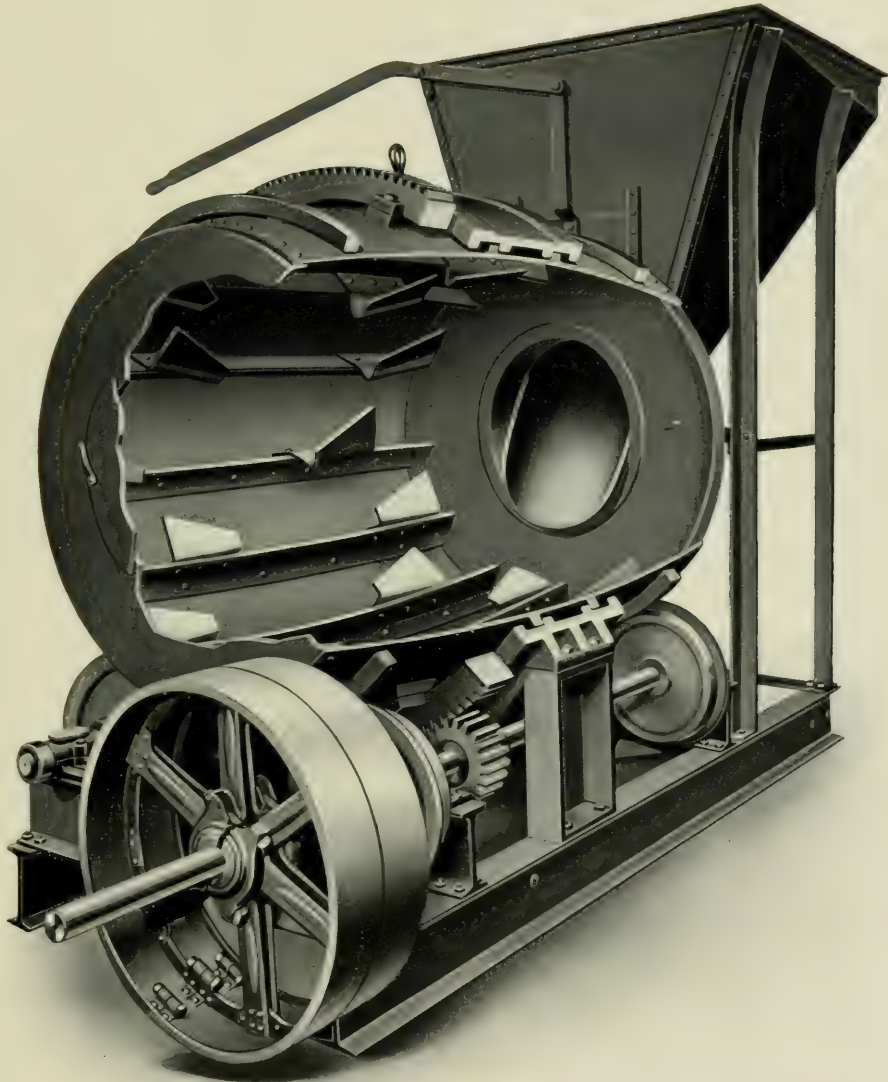
POWER

The three to six-horse power required to drive the Hunso is less than that used by any other effective mixing machine, and not only can \$8.00 per day be saved in labor, over the usual processes of preparing mixed fertilizers, but the tonage mixed is doubled.

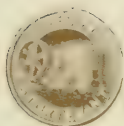
Is it not clear that a machine like the Hunso Automatic Mixer, that can mix and disintegrate 250 to 400 tons in a day of ten hours, and safely save you 75c. to \$1.00 on each ton mixed, or say \$187.00 or more per day with some mixures, is one that really merits attention? But most important of all to the reliable manufacturer is the fact that his reputation is protected by the assurance that every sample analyzed will be practically like every other sample, and sustain his guarantee.



STURTEVANT
MILL
COMPANY



Inside of Hunso Mixer
Note the channels and flights, the dust proof intake.
Simple but massive, nothing to cause trouble, clog, or gum up.



HUNSO AUTOMATIC MIXER



In all heaps of Hunso Automatic Mixer products, the absence of lumps about the base will be noted. This is because materials mixed by this machine are also disintegrated to a great extent. A mixer that does not disintegrate will drop heaps of material from which large lumps of some ingredients will roll down, and then, however carefully mixed, samples drawn must have irregular analyses. If manufacturers are careful of the weights, and analyses of the raw materials, we are not afraid of the ability of the Hunso Automatic Mixer to come easily within one-tenth to one-hundredth of one per cent. of the actual guaranteed analysis of everything discharged therefrom.

CONCLUSION

The remarkable simplicity of the Hunso Automatic Mixer is shown in the cuts. That it is durable goes without saying; after two year's work, it has been reported not to have required any replacements.

Please forgive us for asking you to remember that the Hunso is the only automatic mixer, that every charge placed in it has to be tumbled back and forth many times, and scraped, and disintegrated, and mixed out. Ingredients cannot be discharged until mixing is finished; one batch is exactly like every other of that formula. If one charge is perfectly mixed, all will be. If perfectly mixed it is certain that every sample taken will have the same analysis, and you will not be afraid to manufacture much more closely.

The Hunso Mixer can be seen working on a large scale. You can go and draw your own samples, obtain your own analysis, and draw your own conclusions.

We have hesitated to state the large money saving that may be accomplished by Hunso Automatic Mixing, but we have given you the figures of common practise and you can put them together to suit yourselves or replace them by those of your own.

No cleaning—No clogging.

A report from a user:—

“The following tonnage has been put through the Hunso up to and including April 16th, 1912.

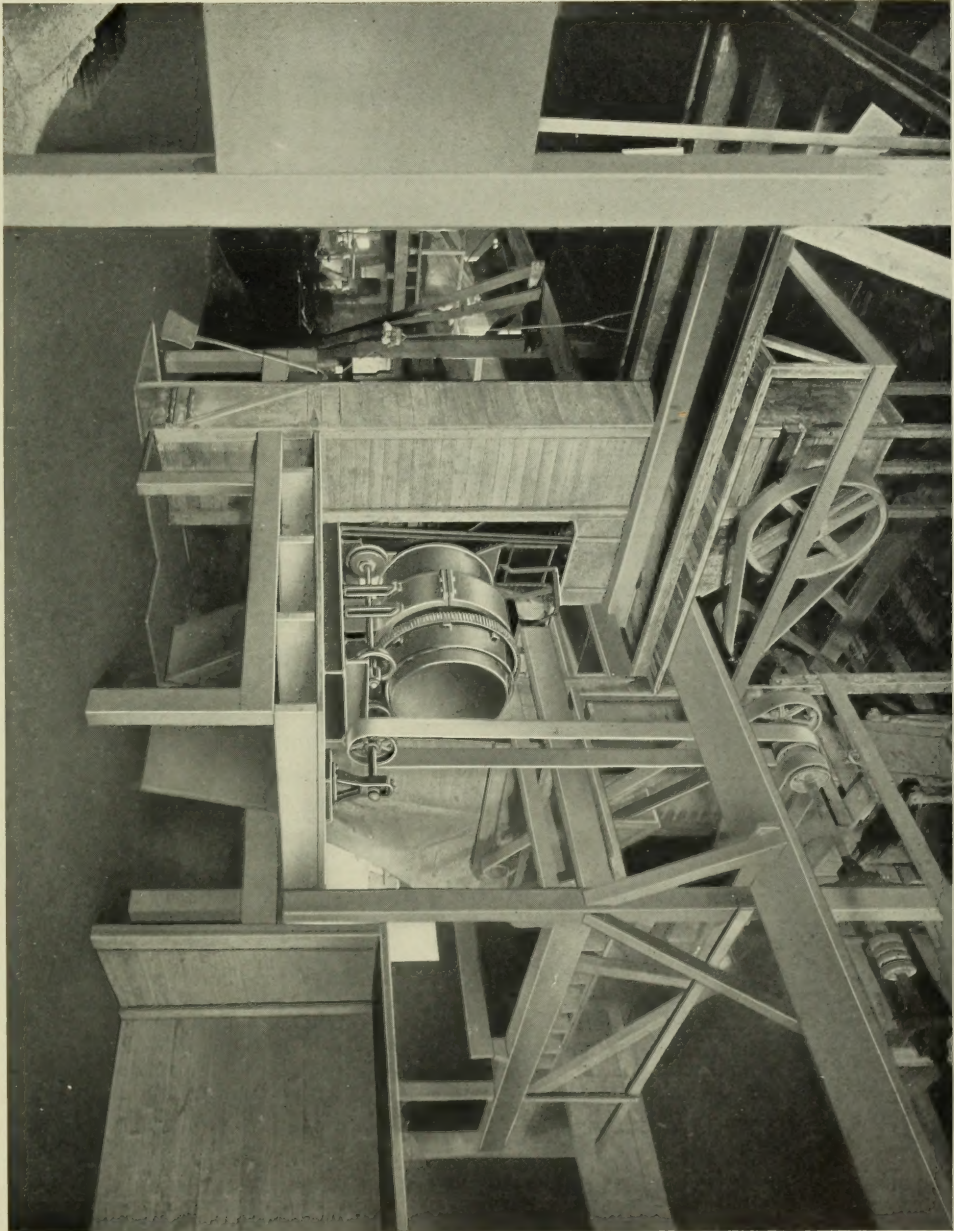
Bagged Goods	9132
Bulk Goods	1314
Total	10446 Tons

This tonnage has all been put through without cleaning the machine a single time.”

Signed (name on request).



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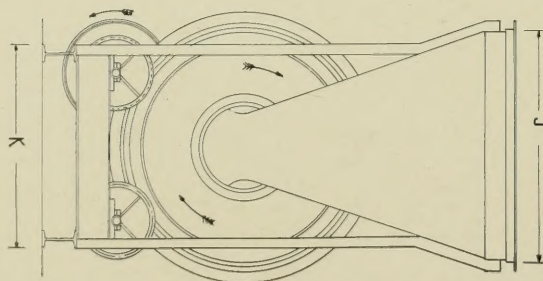
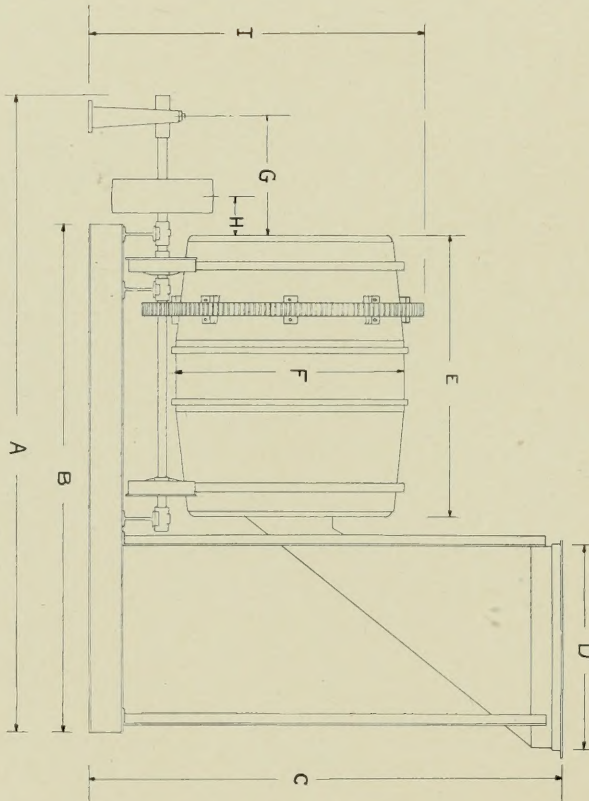
A Hunso Fertilizer Mixing Plant



HUNSO AUTOMATIC MIXER



MACHINE	A	B	C	D	E	F	G	H	I	J	K	L	PULLEY	RPM	DRUM
No 0	8'8"	7'	65 1/2"	4'	3'	20"	6"	4'	3'	9"	2'	7"	20x6	150	20 REV
No 1	12'10"	10'	84 1/2"	5'	3'	1 1/2"	2'	8"	5'	9"	3'	6"	24x6	135	18 REV
No 2	12'7"	10'0"	94"	4'	5'	6"	4'	6"	9"	6'	3'	4'	30x8	154	18 REV



Foundation Plan and Dimensions Hunso Automatic Mixers

CATALOGUE No. 80A